

Vermont Research CORPORATION

1.0 SCOPE:

Technical Specification for VRC Model 1175B Magnetic Drum Memory System utilizing a VRC Model 175B Magnetic Drum and Associated Electronics for a total storage capacity of 40,000,000 bits

2.0 MECHANICAL:

- 2.1 Drum Diameter - 15.0"
- 2.2 Drum Length - 800 tracks
- 2.3 Head Mounting
 - 2.3.1 Magnetic heads are reed supported for aerodynamic operation
 - 2.3.2 Sixteen read/record channels constitute one flying head assembly
 - 2.3.3 Each assembly is individually controlled electrically so that proper drum speed is attained before heads are actuated
- 2.4 Drum is mounted on a vertical shaft running in precision angular contact ball bearings, grade ABEC nine, grease lubricated

3.0 ELECTRO-MECHANICAL:

- 3.1 Drive is an integral induction motor
- 3.2 Speed will be 3450 RPM operating from a 220 volt 60~ 30 power source
- 3.3 Starting time will be 4 minutes or less
- 3.4 Motor may be serviced without access to the main drum enclosure

4.0 MAGNETIC:

- 4.1 Capacity
 - 4.1.1 Track capacity will be 50,000 bits for a bit transfer rate of 3.0 megacycles
 - 4.1.2 50 spare tracks will be equipped with one head per track
 - 4.1.3 Sixteen tracks will be equipped with one head per track for use in system timing
- 4.2 Recorded Clock Tracks
 - 4.2.1 One master index marker track (1 pulse/revolution) will be recorded
 - 4.2.2 One spare index marker track (1 pulse/revolution) will be recorded
 - 4.2.3 One master clock track (1 pulse per serial bit) will be recorded
 - 4.2.4 One spare clock track (1 pulse per serial bit) will be recorded
 - 4.2.5 One master sector clock track (1 pulse per sector) will be recorded
 - 4.2.6 One spare sector clock track (1 pulse per sector) will be recorded
- 4.3 Coating
 - 4.3.1 Recording surface will be nickel cobalt plating

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- 4.4 Heads
 - 4.4.1 Ferrite core .010" wide
 - 4.4.2 Two coils with three leads (center tap common)
 - 4.4.3 Single coil inductance 10 μ h at 140 KC
 - 4.4.4 Self resonant frequency greater than 7 megacycles
- 5.0 ELECTRONICS:
 - 5.1 Matrix Boards
 - 5.1.1 Head Selection signal amplitudes and write current switch are included on matrix boards
 - 5.1.2 One matrix board is used for each group of 16 heads
 - 5.1.3 Matrix boards have self contained logic for selection of 1 head in the matrix
 - 5.2 Read Amplifiers
 - 5.2.1 Five (5) Read Amplifiers VRC Model 2101 will be supplied for data sensing and clock pulse forming
 - 5.3 Write Amplifiers
 - 5.3.1 Two Write Amplifiers VRC Model 2201 will be supplied for data recording
 - 5.4 Registers
 - 5.4.1 One (1) 8-bit Register will be supplied for parallel buffer accepting information from core memory location
 - 5.4.2 One (1) 8-bit Register will be supplied as a serial buffer for transfer of information on to and off the drum
 - 5.4.3 One (1) 20-bit Register will be supplied for the drum address
 - 5.4.4 One (1) 10-bit Counter will be supplied for block identification
 - 5.4.5 One (1) 10-bit Comparator will be supplied for block comparison
 - 5.4.6 One (1) 10-bit Register will be supplied to indicate number of blocks to be transferred
 - 5.5 Parity Check
 - 5.5.1 Parity generation and parity check will be internal in the drum system
 - 5.6 Drum Control
 - 5.6.1 All data flow to and from the drum will be under program control from the computer
 - 5.6.2 All timing and control of logic operations will be synchronized with the rotation of the drum via permanent clock tracks recorded on the drum
 - 5.6.3 Drum unit will generate the following status response codes

Drum Ready, Parity Error, Incomplete Transfer, Write Lock-Out

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5.7 Signal Levels

5.7.1 Output

Logical "1" 3.5 volts \pm .1 volt
Logical "0" 0 volts \pm .5 volts

5.7.2 Input

Logical "1" 3.5 volts \pm 1 volt
Logical "0" 0 volts \pm 0.5 volts

6.0 PACKAGING:

- 6.1 Drum with heads and matrix boards is mounted in a dust tight enclosure
- 6.2 Electronic circuits will be built on standard 4-1/4 x 6-1/4 circuit cards and mounted in a standard 19" card chassis with 27 cards per 19" opening
- 6.3 Drum plus electronics and power supplies will be mounted in a cabinet 28" deep by 50" wide by 69" high
- 6.4 Indicator panel will be supplied showing complete state of the drum and internal logic. Lights will indicate ready state, transfer state, core location register, track address register, initial block number, input-output buffer contents, drum flags and error flags
- 6.5 All maintenance controls will be located at the rear of the machine
- 6.6 Total weight of the completely assembled unit be approximately 1000 pounds
- 6.7 Total power consumption will be approximately 3000 watts

7.0 ENVIRONMENT:

7.1 Temperature

7.1.1 Operating +60° F to +100° F
7.1.2 Non-operating -60° F to +160° F

7.2 Humidity - 95% R.H.

7.3 Shock and Vibration - as encountered in normal handling and shipping

8.0 TESTING:

- 8.1 Electrical testing will be done to a mutually agreeable test specification
- 8.2 All test results will be documented and copies furnished with instruction book

9.0 RELIABILITY:

- 9.1 Drum design life is in excess of 100,000 hours of operation
- 9.2 Bearing lubricant life is in excess of 50,000 hours of continuous operation
- 9.3 All electronic circuits employ silicon semi-conductors
- 9.4 All circuits are designed for non-destruction of recorded data due to power failure
- 9.5 Maximum undetected error rate will be 1 bit in 10^{12} bits transferred

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10.0 SUMMARY:

The above technical proposal is an outline of Vermont Research Corporation's 1175B Magnetic Drum Memory System

It is built around VRC's standard drum Model 175B

Actual system configurations tend to be customized to fit a given computer interface.

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DESC. MAGNETIC DRUM MEMORY SYSTEM

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DATE

VRC MODEL 1175B

REF.

**Vermont Research
CORPORATION**

PRECISION PARK
NORTH SPRINGFIELD
VERMONT, 05150

AREA CODE 802
886-2256

November 4, 1966

Mr. T. Nelson,
Consultant
Box 1546
Poughkeepsie, New York 12603

Dear Mr. Nelson:

Enclosed is the information you asked for on Vermont Research Corporation Drum Memories. The actual specification is for a complete drum system ready to be incorporated with most computer high speed data channels.

The price of the complete system is approximately \$95,000. The drum with heads and read/write and track selection electronics sells for approximately \$50,000.

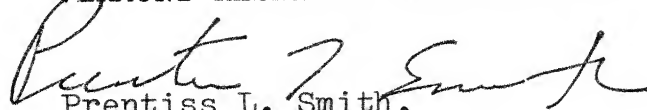
If you have further questions concerning this drum or smaller ones, we will be happy to send you our complete brochure covering 15 models in 3 series presently being manufactured by Vermont Research Corporation.

Prices for other drums range from \$1,000 to \$100,000 depending upon the size of the drum required and the specification for control circuits.

We would be pleased to furnish a complete proposal and quotation covering any of your Magnetic Drum Memory requirements.

Very truly yours,

VERMONT RESEARCH CORPORATION


Prentiss L. Smith,
Vice President, Sales

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